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ABSTRACT

This paper explores the reasons for gardens and natural spaces on school campuses and the effects that such exposure to the natural world has on the students. Blending case studies, observational data, and personal experience, the paper discusses the impacts a garden has on the students who participate in it. During the evolution from rough landscape drawing to fully functioning educational environment, the balance of administrative, teacher, parent, and student involvement is used to determine the lasting effects the garden has on student attitudes toward environmental concerns. Elements of what makes a garden particularly effective at bridging the gap between the children and nature is highlighted and evidence of increased environmental awareness in the students is discussed. (Contains 17 references.) (Author)

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School Gardens:

Raising Environmental Awareness in Children

Shira Brynjegard

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Abstract

This paper explores the reasons for gardens and natural spaces on school campuses and the effects that such exposure to the natural world has on the students. Blending case studies, observational data and personal experience, the paper discusses the impacts a garden has on the students who participate in it. During the evolution from rough landscape drawing to fully functioning educational environment, the balance of administrative, teacher, parent, and student involvement is used to determine the lasting effects the garden has on student attitudes toward environmental concerns. Elements of what makes a garden particularly effective at bridging the gap between the children and nature is highlighted and evidence of increased environmental awareness in the students is discussed.

Introduction

The classroom is an excellent place to introduce the concept of environmental awareness to children. There are a variety of ways to convey the importance of each child's effort and understanding in dealing with the environmental concerns facing the world today. One way of bridging the gap between the abstract "planet" and the child's immediate surroundings is to bring plants and animals closer to the classroom via a garden. Even the most modest planter can allow the children to get a closer look at the living things their teacher is encouraging them to protect and appreciate. Many teachers and schools create gardens and apply them to a variety of curriculum areas, but the effectiveness of these gardens in establishing children as stewards of the Earth is not often measured.

Focus Question

School gardens are places where children of all ages participate in the cultivation and harvesting of plants on or near their campus. This may be done on a small scale, such as in a planter box in front of a classroom, or on a larger scale, such as a spacious designated area shared by all students. The plants may include everything from vegetables and herbs, to native species and trees. In the course of working in the garden, do the children gain unique insights into some environmental issues (including conservation and sustainability) faced by the world today?

Rationale

Hindu philosopher Baba Dioum said "In the end, we will conserve only what we love, we will love only what we understand, we will understand only what we are taught". (Sheehan & Waidner 2000, 71) This is the premise behind bringing children into a garden, and exposing them to the beauty and magic in the process of nature. Only by spending time with their hands in the earth, planting and exploring, do children really learn to love the plants. Watching something transform from seed into seedling, and from seedling into mature plant is an experience not available to everyone. It requires patience, care and an opportunity.

A school with a garden provides that unique opportunity to activate a child's awareness of the environment in a lasting way. "Such moments of acute sensory awareness stay with us always. Imagine if every school day produced memories of such power". (Kovalik & Olsen 1994, 81) Experiences in the garden provide what no book or video can. When children are immersed in an enriched environment, their brains are awakened and new growth is inspired. (78)

Observation alone, however, is not enough to convince them. Children need guidance to understand what is taking place so slowly before their eyes. They need someone to remind them to slow down from time to time and to model the responsible behavior of a good eco-citizen. School gardens are natural spaces, sometimes isolated by the concrete and asphalt of the city. They are meant to encourage and empower children to change their community and the world for the better. (New Horizons, 2000) It takes school community to help awaken that first spark of environmental responsibility, but

once the students have been taught to recognize the garden as a microcosm of the planet, the path to stewardship becomes an inviting one.

Background and Need

Disinger (1990) discussed environmental education for a sustainable future. In the article, he emphasizes the ever-expanding role of educators in raising environmental awareness in children. Disinger cites the public's support for environmental education as part of the school curriculum. Unfortunately, when he wrote this article, the support of the public was not enough to inspire any real emphasis on it in the classroom. He urged educators to address issues of sustainable development and topics related to environmental concerns.

Five years after Disinger wrote his paper, Robin Moore studied the subject in Children Gardening: First Steps Towards a Sustainable Future. He focused on the primary grades using gardening as a daily learning experience that allowed contact with nature. His case study examines the results of introducing young children to gardening and its effect on their understanding of basic environmental concerns. He argued that children who live in urban areas "need a connection to the natural world" (Ness & Wasescha, 1998, 5).

A professor of landscape architecture, Moore found that children thrived when exposed to a natural environment and saw them as the bridge to the future of the planet. Moore (1995) is a strong supporter of children learning through interaction within an educational environment. He sees gardening, especially in the primary grades, as the key to exposing children to the environmental movement, including the concept of sustainable development.

Moore offers a definition of sustainable development as it applies to the current generation. He discusses the need for "a massive reorientation of public education…so that a base of sustainable development values can develop in society."(223) Moore believes that these values should be instilled in children through activities such as gardening, so that they may fully take root in society and persevere in the generations to come. He goes on to say that children all across the world are too quickly losing contact with the natural world. He blames things like television for interfering with children's exploration of the natural environment, and seeks to amend the situation with the help of educators and parents.

Moore then relates the story of his involvement with a primary school in the San Francisco Bay Area. He describes his part in the effort to transform an asphalted area into a viable natural habitat. The next portion of Moore's article outlines the ten-year garden project from groundbreaking to completion and the positive results that came out of it. The trials and tribulations of the effort are detailed as learning experiences for the children, as well as the surrounding community. Included in his account is the creation of a greenhouse, the transplantation of the entire site onto a more feasible campus location, and the grants and fundraising that sustained the project.

Moore and Wong (1997) expand upon the authors' accomplishments at the inner city school and detail the project from start to finish. It uses photographs and anecdotes from teachers, parents, and students to supplement the description of the ten-year project, which would serve as a model for school gardens worldwide. Moore and Wong conclude that their observations at the garden prove its effects on children's understanding of sustainability issues.

Review of the Literature

Why do schools need gardens?

Although they may not be as high on a school's priority list as they should be, gardens are one of the best learning environments to provide for children. This first part of the literature review examines why this is true. It looks at research that has been done on experiential learning practices and applies them to school gardens and natural spaces. It also begins to explain why children seem to absorb so much more information about the natural world when they are in a garden.

Boss (1991) advocates experiential learning experiences for children, including school gardens. She believes that the way to cure the apathy of American citizens is to start by involving children in community life. Catching them as early as possible and introducing them to the concept of service learning, she says, gives students a sense of meaning in their education and directly improves the community. As students get older, she sees cultural journalism and programs like Outward Bound as a way to further develop their connection with the environment.

Boss bases her research on the work of noted educational pioneer John Dewey and educational psychologist Howard Gardner. Dewey saw experiential education as an important component to learning about civics. In his vision of the school as its own small democratic society, the garden was a good place to learn from experience and could bring benefits to every subject area in the classroom. Gardner's views, Boss interprets, support hers because of a shared belief in outdoor education as a means to use the "student's whole environment as a source of knowledge."(Boss, 1999, 1)

One of the programs that Boss advocates is Outward Bound, which is what she refers to as adventure education. She explains that the program takes teenagers who are otherwise unfamiliar with the natural environment, into a wilderness area. The participants are supposed to have their self-confidence increased, while simultaneously gaining environmental awareness. She says it fosters a connection for the teens between themselves and the environment, which many city dwelling kids are lacking.

Boss also advocates service learning programs as a way to engage students in both voluntary community service and political activism. She uses a garden as one example of where service learning can be implemented, with the added benefit of being on or near school grounds. She mentions that students can gain from service learning an attitude of responsibility in civic affairs and problem solving skills in a more tangible atmosphere. She lists the requirements for a successful service learning program, and briefly describes students planting vegetation on a stream-bed to demonstrate how service learning can raise environmental awareness in students.

Farmer and Wott (1995) examine a study done on fourth grade students to find out how much is actually gained by taking them on field trips and doing follow-up activities. Their study gives the results of a pre-test and post-test proving the worth of having concepts reinforced through such activities.

Pivnik (1994) examines human alienation from the natural world and the effect that it is having on a new generation of children. She advocates gardening as a means to bridge the connection between students to nature that otherwise would be lost in a city.

Lerner (2000) writes primarily about the creation of school yard and back yard habitats endorsed by the National Wildlife Federation. He offers tips on how to create a

school yard habitat and gives examples of schools that already have them in place. Lerner writes about the National Wildlife Federation's commitment to educating children about ecology, and suggests that interested parents and educators look into the benefits of the program.

Dannenmaier (1998) is dedicated to inspiring children's gardens, both in school and at home. She discusses the history of children's gardens throughout the world, and their role in child development. She offers specific suggestions for creating natural spaces for children for the purpose of increasing their quality of life, by satisfying the need for exploration and play as well as their personal connections with nature.

Morris, Briggs, and Zidenberg-Cherr (2000) write about school gardens as a means to educate students about healthy eating habits, and simultaneously raise their environmental awareness. Their research touches on social cognitive theory and how it is put into practice in specific San Francisco Bay area school gardens with positive results. They also focus on both upper elementary and high school students in schools across California and offer suggestions for garden based curriculum as a means to encourage attention to nutritional guidelines.

Once a garden has been established at a school, any child can confirm that it is not only a fun place to visit, but perfect for those sunny days when they just can't stand to be indoors any longer. Children love to visit the garden because it is always full of surprises. They never know what will be new or different about it from one day to the next, and so they happily charge into it eager to see what awaits their senses. Most of all, they learn respect for the earth without even realizing it.

Case Studies of School Gardens

The second part of the literature review focuses on articles that describe the success of specific school gardens across the country. Beginning with the earliest examples and moving forward in time, the case studies demonstrate that school gardens have been a part of children's lives for years, even if they are seldom considered to be "news-breaking".

Cothren (1976) focuses on a specific garden project in Brooklyn. His article outlines the outdoor garden's effect on children's understanding of the Earth and the concerns they developed for its ecological balance.

Demas (1979) discusses and describes garden projects across the country taking place in schools and homes. His article is one of the earliest references regarding the specific use of the garden to teach environmental concepts.

Hanscom and Leipzeig (1994) describe a garden at a school in Denali, Alaska, over the period of five years that it evolved. The article details the school's specific focus on "not just science, but environmental education". It features activity guides and some suggestions relevant to indoor propagation, as the school strives to have a garden year-round, despite the obvious weather restrictions. At the close of the article, the garden is still going strong and hopes to continue to inspire love of the environment in the children who grow up with it.

Bradley (1995) writes a case study of an elementary school in inner city Phoenix. The school had a vision to create environmentally responsible citizens, and decided to create an "oasis" on campus that would foster their ideals. Most of the article describes

the effort that went into the planning of the garden. It emphasizes the involvement of the teachers, staff, community, and every child throughout the yearlong process.

Bradley includes a map of the garden plans, and explains how each classroom contributed their ideas into the project. She mentions the training offered by the Arizona Department of Fish and Game, and local zoos to the students and the staff in preparing the site. Bradley also lists the outside resources, such as the Fish and Game that contributed to the success of the project.

Bradley concludes her article by sharing the positive results of the project. She emphasizes that only by involving everyone in the process was the sense of ownership created, and that she expects the benefits of the garden to be long lasting.

Chen (1998) evaluates a unit developed for middle school students in New Jersey that uses a cross-curricular approach to teach the importance of sustainable agriculture. The unit includes twelve lessons that focus on various environmental concerns and how sustainable agriculture and other strategies can be implemented as creative solutions to the problems.

With the exception of those two articles from the nineteen seventies, there seems to have been little written about gardens in schools until the last decade or so. Fortunately, the more recent articles show a resurgence of interest in school garden projects. As the population became more aware of the serious environmental issues facing the earth, they struggled for a way to re-connect children with nature, and once again they looked to the garden to serve that purpose.

Methodology

Data for this paper has been collected in the course of visiting several elementary schools in the San Francisco Bay Area. At each of the sites, observations were recorded in a journal and interviews took place with teachers, parents, and students who were currently involved in the garden. The gardens were in various stages of development, and had varying levels of participation in the school. Personal experience on the topic was obtained in the form of reflection upon the 500^2 garden I established at an elementary school in Napa, California two years ago. A journal and scrapbook was kept at that time, and the site has been revisited a few times since then. The information has been compiled for the purpose of examining the environmental attitudes of the involved children to determine how much of an effect a garden has on their understanding and appreciation for the environment.

Narrative Description

It was called The Watershed Project. Its purpose was to teach elementary school children about environmental awareness in their community through service learning projects. I was assigned a lower income school in the Napa Valley and given free reign to decide with the principal how to accomplish The Watershed Project's goal that year with the AmeriCorps program. The principal of the school I'll refer to as Green Elementary School was impressed by the purpose of the project and thrilled to have a full time volunteer on site. In out first meeting, I proposed the idea of using my time on campus to start a school garden from scratch. She offered her enthusiastic support and a sizable area on the grounds to establish a garden.

The space I was given was adjacent to the play field, but not part of it. Probably because the way we found it, not even grass would grow there. Undeterred by the abundant weeds and ample supply of large rocks just below the surface, that space eventually became a thriving garden. By Earth Day 1998 I held a dedication ceremony for the garden and the koi pond in it. The celebration was attended by every class we could squeeze insides the garden site. The journey to that point had not been easy, but everyone agreed it was well worth the effort.

Early on in the project, it became clear that there was literally no funding for it. However, when I addressed the teachers at a staff meeting, most still expressed interest in participating in what came to be known as The Garden Project. We decided to go ahead with the project using only tiny, eager hands until the PTA was convinced it was worth whatever money it could spare.

I started to take groups of students out twice a month for an hour, half the class at a time because that was all I could hope to manage. The teachers instantly signed up, thrilled with having an hour where they could cut their class size in half and work with a smaller group. Furthermore, only children with good behavior were allowed to work in the garden, so it became an added incentive for the kids to behave, at least during their garden week.

For the first two weeks the students did nothing but pull the enormous weeds and remove hidden rocks from the ground. It was a brutal assignment, and I expected much whining and goofing around. I was wrong. The kids enjoyed being outside so much, there were debates over whose turn it was to go out there. They referred to the designated area as "the garden" from the first day, even though it would be months before it even

resembled such a place. They relished the chance to get their hands muddy, and they cooperated like never before to pull weeds that went two feet into the ground. They dug up rocks with only the handful of cheap spades I'd bought on sale for them, and squealed with delight every time they discovered a bug or a worm.

I came in one Monday morning to find that anonymous neighbor with a small tractor had smoothed and leveled the ground for us. The children attributed the work to a "garden fairy" and took it as sign that their garden was destined for instant success. With the timeline suddenly moved ahead, I immediately put the word out asking for donations. The upper grades made posters asking the neighborhood for any used garden tools, clay pots, and any plants and seeds so that we could get started before the weather got too cold and rainy.

The worn shovels trickled in, along with a rusty wheelbarrow and an assortment of leftover one-gallon plant containers. Students brought seeds in plastic sandwich bags from flowers in their yard, and dug up any overgrown sections from their landscaping to transplant. The teachers and I solicited donations of seeds from local nurseries and brought in watering cans because we still didn't have a hose for watering.

As soon as there were seeds and seedlings to put in the ground, we started planting. The students of all ages carefully prepared raised beds as best they could and, before long, there were the beginnings of radishes and peas peeking through the dirt. The students reminded each other not to step in any of the raised beds and to revere each worm they encountered as a "garden friend".

The garden had some troublemakers too. Gophers moved in quickly, probably thankful for the newly softened dirt for digging tunnels. We discussed the gopher issue in

the garden and explored all the possible options. One solution that was an all around favorite was the introduction of gopher snakes to the area, but in the end, the students settled on another humane and natural way to handle the intruders. The California Conservation Corps donated some "gopher plants" to deter the gophers and give the students a pro-active feeling about handling the situation, and any remaining gophers who dared to emerge were creatively herded into a humane trap and relocated. This solution was one of the first examples I saw of the student's genuine concern for all living things. Their parents might have cured a similar problem with poison or blunt instruments, but the thought of harming a living creature was not an option for these students.

By the end of the first semester, the garden actually looked like a garden. The PTA had seen the dream becoming a reality and offered small amounts of funding as it could. When the sixth graders covered the garden with hay just before winter break I stood back and was amazed at how their attachment for this piece of earth had made them forget their pre-teen attitude problems and take the garden project so seriously.

When the winter rains settled down, the garden was back up and running constantly. There was a lot of work to be done in it, but I had all the help I could need with students volunteering every day at lunch and after school to lend a hand. As I brought the classes out, they would start by eagerly exploring the area to see what had changed since they last saw it.

Participation in the project by students and the community picked up with astonishing pace. The students in one class read a gardening book and decided we needed a bean teepee. They built one out of willow sprigs which later flourished into new trees.

The superintendent happened to be on campus one day, and the principal dragged him out to see the garden. The impromptu visit led to additional funding to secure the garden area with a chain link fence. Once the fence arrived, support from the community grew and donations of tools and plants poured in for the project. The fence made the garden more obvious to everyone, and gave it the sense of permanence it had been lacking. Before long, the students had to re-arrange the garden layout to accommodate the rapid growth, and finding empty spaces to plant became a challenge we would never have imagined at the start of the project.

It was during this renovation that the fifth graders from one class decided it would be nice if the garden had a fish pond. It sounded like a good idea, so I let them start digging. I had no idea of the implications of installing a real pond until the word was out and the whole school was excited about it. It was an arduous task to move enough dirt to prepare the space, especially with mostly small children moving it one bucket at a time, but we somehow managed to finish it in time for the Earth Day dedication. With the help of donations from the community and a few local environmental organizations sponsorship, the pond had a working pump that fed a small waterfall, supported three small koi, and was filled with tadpoles courtesy of a local toad.

The Earth Day dedication will always remain one of my best memories of that year. That morning the garden was bursting with kids cheering the ceremony on, with invited community members standing by and parents lined up outside the gates to watch. There could not have been a more perfect celebration of Earth Day.

The garden continued to bloom and grow and change throughout the year, and by the end I had decided to move on and become a teacher. I left the garden in the capable

hands of another AmeriCorps volunteer, and have gone back to visit it on several occasions. Every time I go by there, a part of me worries "What if the garden hasn't been kept up?" "What if they lost interest and stopped caring for it?" It is a reasonable fear because now there is no AmeriCorps volunteer to maintain it as there was in its first two years. Additionally, the school has come under strict corporate leadership in an effort to raise test scores in that economically disadvantaged area. When I visited the Green school in the fall, it was still being utilized by some of the classes, although they were having difficulty keeping up with the tremendous responsibility of such a large space on their own. When I returned in early spring, the principal informed me that the participating teachers had become overwhelmed with the task, and had agreed to turn over management of the garden to the day care facility on campus.

I spoke with Marsha, the day care director shortly after my visit and she gave me the details I was looking for. Marsha had grown up in a rural area that had a school garden and when she saw the Green school's garden in need of some assistance, she asked for permission to take over the site. In the last two months, she informed me donations were pouring in to restore the garden site. A volunteer recently rototilled the entire space to prepare it for the new plants and the drip irrigation system, which was donated by a local winery. Marsha says the children are very excited to start planting again, and that classes will be welcome to come out and work in the garden during the school day as soon as it is ready.

In the course of my research this year, I visited several other San Francisco Bay area schools as well to study the impact of their garden projects on student's environmental awareness. I want to focus on three of them in particular. One school I'll

refer to as Sprinkler, because that was their biggest garden issue at the time. Another will be Overgrown, because that's how I found it. The last school will be Lucky, because it was a private school and that gave it several advantages over the other two.

Sprinkler's gardens were actually spread out all over the school and there was no efficient way to water them, hence the sprinkler problem. I sat in on their garden committee meeting and spoke with the staff, and the students who were most involved with the project at Sprinkler. Like the school I had worked with, Sprinkler's kids shared a love for their gardens. Some classes had their own and some classes shared the space, but all the students I spoke with described how they liked to just be outside with the plants, encouraged to get their hands dirty and watch something grow where nothing had been before. A fava bean area was a favorite for one class, because the kids were allowed to go and hide in the middle of it while they read. Another class specialized in native plants and could tell me the names of several species they'd planted.

Overgrown was a school not far from where there had been abundant farmland and pastures not so long ago. Some of the kids still lived on acreage, but most of them were from the cheap, crowded apartments across the street. I visited Overgrown because I'd heard it had a nice garden, but when I got there I found what had been their garden neglected and overgrown. The teachers I spoke with there told me that they had a strong garden project in previous years, but that lately no one had taken responsibility for maintaining it. Likewise, the kids remembered working in the garden and expressed their disappointment at not having been taken out there since then. The garden had obviously meant a lot to those students, and they were frustrated that their weeks didn't include garden time anymore.

I returned to Overgrown a couple of months into the next semester and was pleased to see that their garden efforts had been somewhat resurrected. The planter boxes outside the classrooms were filled with brand new plants, some of which were from seeds but most had been started at commercial nurseries. Their sizable greenhouse had not been put back into use, and last year's plants in the actual garden space had still not been tended, but the semester was young and the students were hopeful. At least, they told me, they were working in the planter boxes, if only to put in pretty flowers that they didn't even get to choose. One class had an empty looking planter box, but I discovered that they were one of the few who had "dead-headed" plants they liked and collected the seeds for replanting. Their teacher took pride in sharing with me the efforts of his class to stand out from the school and grow their flowers "from scratch". The sense of ownership in the planter box of that class was particularly evident as some students I talked to shared some of their eclectic plant choices.

Lucky was the one private school I visited. It was located in an upscale area and the campus was spread out over several acres of natural woodland. The biggest reason to call the school Lucky is that it was fortunate to have a part time garden coordinator to work with students in their large garden. Lucky, however, only allows kindergarten and primary grades in the garden so I spent a day out there with only kindergartners and the garden coordinator to interview. As it turned out, both had plenty of information to share with me.

The garden featured a variety of plants, some of which were organized into several smaller growing areas, such as a tea garden, butterfly garden, and even a pizza garden. There were all kinds of plants represented, including everything from cacti and

oak tree seedlings to strawberries, corn, lavender, and irises. There was a weather station in each planter bed and compost in different stages around the grounds.

Just outside the fence was a sitting area with a chalkboard, table, and enough little chairs for an entire class to sit in. There was also a "discovery table" with artifacts for the children to inspect ranging from a deer skull, to bird nests, feathers and rocks. The nearby shed was filled with tools, books, and old student projects. I was later told a greenhouse was also planned, but with little funding and no electricity at the site, it was more like a dream. I could not help but think of the other schools I had visited that had a greenhouse but were not using it.

The kindergarten's theme in the garden this year is "paths" and the projects they have been working on are field guides. There was a short session in the sitting area before the children went into the garden. The coordinator reviewed what they did last time, and told them that today's adventure would be about all the "creepy crawlies" that live in the garden. The children offered several examples of bugs and other creatures they had seen before, and were organized into pairs. Each pair was given a hand lens and a paper cup to collect in. Before they set out, they reminded each other of how to treat the creatures they might find with gentle kindness.

Once they were set loose in the garden the kids were on a bug hunting frenzy. They eagerly looked everywhere for anything with more than two legs. The coordinator and their teacher helped them search, and when anyone found something, the others would race over to see it. The bugs were carefully placed in the paper cups and contained with the hand lens. One pair of children actually found a salamander to collect, and the others found centipedes, aphids, crickets, and spiders. The children were careful not to

disturb the places where they found the creatures, but to remember it so that they might return everything to its proper home later.

The group reconvened when everyone had something in their cup to share. Some of the children had even named their many-legged friends as they waited for their turn to share. When called upon, they let the other children see what they found and give a vivid description of any details they felt were relevant to the capture. A short discussion was lead by the coordinator and as they headed back to their classroom, the children walked back through the garden and released their finds into the original locations. I asked them why they were putting the bugs, some of which had been given names, back in the garden, the kids looked at me like I had just asked the most obvious question they had ever heard. One memorable reply was from a child who said, "Because this is where they live, and they have families here and a job to do".

Before my visit to the Lucky school was over, I had a chance to talk with the coordinator about what goes on in the garden. She notices a change toward environmental awareness in the students she works with that goes beyond physical and emotionally maturity. She said, "Kids who participate in the garden tend to think of what a garden's needs are in comparison to their own, then apply that reasoning to the world beyond the garden." That explanation may have something to do with why the kids did not leave a single paper cup behind as they said "good-bye" to the garden until the next week.

Themes

A genuine garden project needs to a core group of dedicated teachers and at least one administrator supporting it. Throwing money at it doesn't work because the kids do not buy into it unless they see adults modeling the process every step of the way. I never

spent a day in the garden without at least picking up a shovel, even if there were no kids out there to see it, and everyone knew it. The garden coordinator at Lucky is also out there beyond the allotted hours, attending gardening workshops at the local university, tending the plants, and constantly trying to "sell" the garden to the parents and administrators. A garden needs at least one adult to really put their heart into it, spending every spare moment encouraging others to follow. It also helps tremendously if there is also a committee to support it with an administrator to back up their decisions.

I found that a school garden works the best when it is a garden for the whole school, not individual classrooms. While having separate sections can be nice, over-segregation demolishes the unity that the garden should naturally bring to a school. Vandalism, and even accidental damage, is also less frequent when a whole school takes ownership of the garden. Kids are more likely to protect the plants from flying soccer balls and keep an eye out for litter when they feel equally responsible for all the plants.

Gardening is also highly contagious. Students will jealously watch kids from other classes in the garden and beg for a similar opportunity. Likewise, teachers who learn how easy it is from their colleagues and of the variety of lessons that can be applied there are more likely to spend time in the garden with their class. Once a student or a teacher has spent some time in the garden, find it harder and harder to stay away from it.

Most of all, it is important for the students to have a voice in making decisions that effect the garden. The students were overwhelmingly more attached to and interested in the parts of the garden that they had personally designed and chosen the plants for. So few decisions are left to students in the classroom, that empowering them to make even

the smallest decision about the garden is taken very seriously and provides a sense of ownership that would otherwise be lost.

Conclusions

No successful gardener is without the skill of observation. Children are natural experts at this. They will eagerly notice the newest spider's web, or caterpillar. They notice the texture of leaves, and the brightness of petals. These images find their way from their eyes, to the minds and their hearts. They begin to understand that each plant needs the sun, earth, air and water to grow, and can be hindered by the slightest of pests, drought, cold, or human indifference. Perhaps without even realizing it, they see the value of living things and how they relate to the quality of our lives. They take this knowledge home with them, and keep it with their fondest childhood memories. As they grow older, I believe the good feelings they associated with plants and nature will reoccur time and time again. A garden leaves an indelible mark on a child's mind. It broadens their view of the world, breathes life into their imagination, and respect for the earth into their hearts.

Implications

The ultimate goal of any garden project is to develop a set of long term environmental values for the child to carry through life. It may effect the way they vote for environmental legislation, or discover a career path they might not have taken. Perhaps, what I hope for the most, is that these values will be passed on to future generations; we must restore the sense of responsibility and appreciation for the environment that has long since gone to the wayside partially as a result of the population explosion in the last century. There currently are not a lot of jobs out there for elementary

school teachers with environmental expertise, I hope someday the value of such people will be recognized and garden projects implemented at more schools across the country as they are in other parts of the world.

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